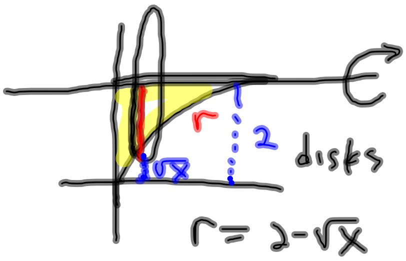
29 c $y=\sqrt{x}$ $y=2$ $x=0$ about $y=2$



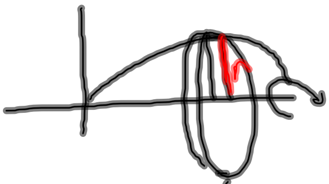
$r = 2-\sqrt{x}$

$$\int_0^4 \pi \left(2-\sqrt{x}\right)^2 dx$$

49 b

109g

$8.5 \frac{g}{cm^3}$



$r = \frac{x}{12}\sqrt{36-x^2}$

$v = \int_0^6 \pi \left(\frac{x}{12}\sqrt{36-x^2}\right)^2 dx = \frac{36\pi}{5}$

$d = \frac{wt}{Vol} = 8.5 = \frac{x}{36\pi/5\ cm^3}$

$x = 8.5 \frac{g}{\cancel{cm^3}} \cdot \frac{36\pi}{5} \cancel{cm^3}$

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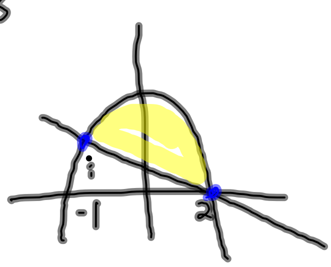
18



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7.3 b volumes of known cross sections

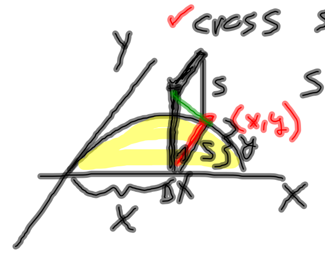
volumes of revolution with shells

$$V=\int_a^b \text{area of cross section } dx \text{ or } dy$$

cut ⊥ x-axis (dx)
cut ⊥ y-axis (dy)

ex. base: one arch $y=2\sin x$

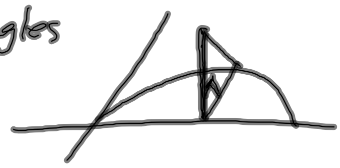
cross sections ⊥ x-axis: squares



$s=y=2\sin x$

$$\int_0^{\pi}(2\sin x)^2\,dx = 2\pi$$

isos. triangles



$$\tfrac{1}{2}s^2=\tfrac{1}{2}(2\sin x)^2$$

$$\int_0^{\pi}\tfrac{1}{2}(2\sin x)^2\,dx$$

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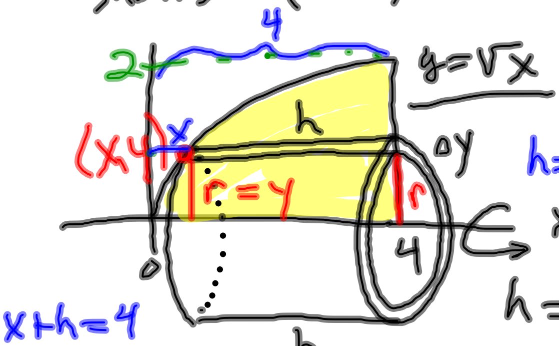
volumes of revolution

shells (can)



$h=4-x$

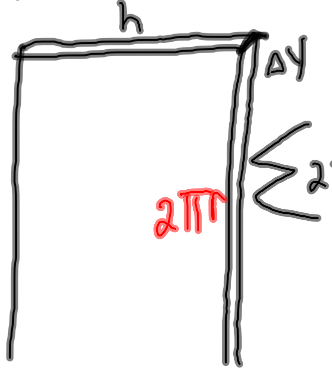
$h=4-y^2$

Shell method

$$\int_a^b 2\pi r h\,dx \quad \text{vertical rect.}$$

or

$$\int_c^d 2\pi r h\,dy \quad \text{horiz rect.}$$



$$\sum 2\pi r h \Delta y$$

$$\int_0^{\cancel{4}\,2} 2\pi y(4-y^2)\,dy$$

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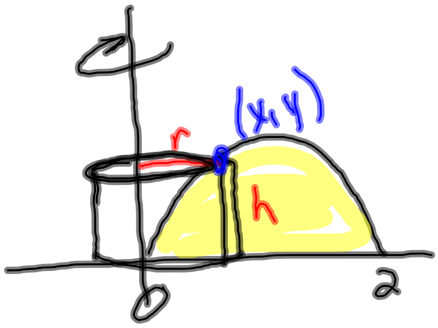
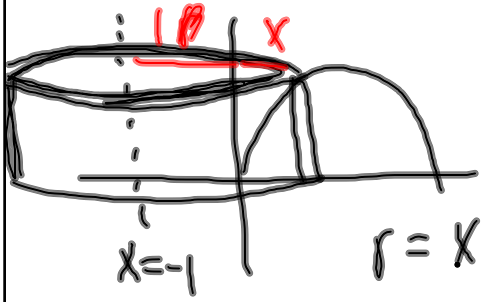
$y = -x^2 + 2x$, x-axis rotate around y-axis



$r = x$

$h = y = -x^2 + 2x$

$$\int_0^2 2\pi x\,(-x^2 + 2x)\,dx$$



$r = x + 1$

$$\int_0^2 2\pi\,(x+1)\,(-x^2 + 2x)\,dx$$

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